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Relevance scale ☐ ☐ ☐ ☐ ☐**1** [Design and analysis of an algorithm for fair service in error-prone wireless channels](#)

Songwu Lu, Thyagarajan Nandagopal, Vaduvur Bharghavan

July 2000 **Wireless Networks**, Volume 6 Issue 4Full text available: pdf(317.34 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)**2** [A Markov-based channel model algorithm for wireless networks](#)

Almudena Konrad, Ben Y. Zhao, Anthony D. Joseph, Reiner Ludwig

July 2001 **Proceedings of the 4th ACM international workshop on Modeling, analysis and simulation of wireless and mobile systems**Full text available: pdf(729.38 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Techniques for modeling and simulating channel conditions play an essential role in understanding network protocol and application behavior. In [11], we demonstrated that inaccurate modeling using a traditional analytical model yielded significant errors in error control protocol parameters choices. In this paper, we demonstrate that time-varying effects on wireless channels result in wireless traces which exhibit non-stationary behavior over small window sizes. We then present an algorithm t ...

**3** [On improving the performance of IEEE 802.11 with relay-enabled PCF](#)


Hao Zhu, Guohong Cao

August 2004 **Mobile Networks and Applications**, Volume 9 Issue 4Full text available: pdf(594.85 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Integrating wireless LAN (WLAN) techniques with the third generation cellular networks has become a promising way to improve the performance of wireless systems. As WLANs play an important role in such heterogeneous systems, the performance of WLANs becomes important to the whole system. It is well known that WLANs provide a physical layer multi-rate capability, and hence MAC layer mechanisms are needed to exploit this capability. In this paper, we propose a novel MAC layer relay-enabled point c ...

**Keywords:** IEEE 802.11, media access control, rate adaptation, relay**4** [Optimizing the end-to-end performance of reliable flows over wireless links](#)

Reiner Ludwig, Almudena Konrad, Anthony D. Joseph, Randy H. Katz

Full text available:  [pdf\(230.41 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Pure end-to-end error recovery fails as a general solution to optimize throughput when wireless links form parts of the end-to-end path. It can lead to decreased end-to-end throughput, an unfair load on best-effort networks, and a waste of valuable radio resources. Link layer error recovery over wireless links is essential for reliable flows to avoid these problems. We demonstrate this through an analysis of a large set of block erasure traces measured in different real-world radio environments, ...

**Keywords:** TCP, flow differentiation, link ARQ persistency, wireless

5 Wireless data: systems, standards, service

Antonio De Simone, Sanjiv Nanda

March 1995 **Wireless Networks**, Volume 1 Issue 3

Full text available:  [pdf\(1.14 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

Wireless data products and services being proposed today include exotic mixes of services and technologies: packet transport over cellular circuits, facsimile service over Cellular Digital Packet Data (CDPD), voice and video over wireless LANs, and everything in between. Data networking terms that seem to have a clear meaning—data-link, network and transport layers; circuit-mode and datagram; connection-less and connection-oriented—in fact have meaning only in context. Thus TCP, ...

6 Experience with "link-up notification" over a mobile satellite link

Martin Duke, Thomas R. Henderson, Jeff Meegan

July 2004 **ACM SIGCOMM Computer Communication Review**, Volume 34 Issue 3

Full text available:  [pdf\(429.96 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

Over paths characterized by extended outage periods, a TCP connection can suffer a severe performance penalty due to its Retransmission Timeout (RTO) backoff mechanism. If outages are long enough, the RTO can grow large enough to cause unacceptably long pauses when the link is eventually restored. One proposed solution is "Link-Up Notification" (LUN), which involves an intermediate device that can detect the link state. When the link is restored, the device immediately sends a packet that cau ...

7 Session I: QoS in ad hoc and infra-structure based wireless networks: Voice transmission in an IEEE 802.11 WLAN based access network

Andreas Köpsel, Adam Wolisz

July 2001 **Proceedings of the 4th ACM international workshop on Wireless mobile multimedia**

Full text available:  [pdf\(246.56 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

*IEEE 802.11* contains a mechanism for transmission of data with realtime constraints known as *Point Coordination Function*. This supplementary medium access protocol resides on top of the basic medium access mechanism *Distributed Coordination Function* and uses a centralized polling approach. Due to the complexity of a PCF implementation and the predicted inefficiency of the PCF several proposals have been presented for providing QoS support without the need of a centralized sc ...

**Keywords:** DCF, IEEE 802.11, PCF, WLAN, best-effort, real-time, scheduling, voice transmission

### The effects of asymmetry on TCP performance

Hari Balakrishnan, Randy H. Katz, Venkata N. Padmanabhan

October 1999 **Mobile Networks and Applications**, Volume 4 Issue 3

Full text available:  pdf(382.76 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we study the effects of network asymmetry on end-to-end TCP performance and suggest techniques to improve it. The networks investigated in this study include a wireless cable modem network and a packet radio network, both of which can form an important part of a mobile ad hoc network. In recent literature (e.g., [18]), asymmetry has been considered in terms of a mismatch in bandwidths in the two directions of a data transfer. We generalize this notion of bandwidth asymmetry t ...

### 9 A Survey of Energy Efficient Network Protocols for Wireless Networks

Christine E. Jones, Krishna M. Sivalingam, Prathima Agrawal, Jyh Cheng Chen

September 2001 **Wireless Networks**, Volume 7 Issue 4

Full text available:  pdf(271.55 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


Wireless networking has witnessed an explosion of interest from consumers in recent years for its applications in mobile and personal communications. As wireless networks become an integral component of the modern communication infrastructure, energy efficiency will be an important design consideration due to the limited battery life of mobile terminals. Power conservation techniques are commonly used in the hardware design of such systems. Since the network interface is a significant consumer o ...

**Keywords:** energy efficient design, low-power design, mobile computing, network protocols,, power aware protocols, wireless networks

### 10 The effects of asymmetry on TCP performance

Hari Balakrishnan, Venkata N. Padmanabhan, Randy H. Katz

September 1997 **Proceedings of the 3rd annual ACM/IEEE international conference on Mobile computing and networking**

Full text available:  pdf(2.02 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

### 11 Wireless ATM: an enabling technology for multimedia personal communication

D. Raychaudhuri

August 1996 **Wireless Networks**, Volume 2 Issue 3

Full text available:  pdf(403.21 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

An ATM-based wireless network capable of supporting integrated voice, video and data services with Quality-of-Service (QoS) control is proposed as a key element of the future distributed multimedia computing scenario. A specific architecture for "wireless ATM" is described, and design issues are briefly discussed for each major functional layer of the network. The system approach is based on the incorporation of wireless channel specific medium access, data link and wireless con ...

### 12 Sensor networks: A fast and reliable protocol for wireless sensor networks in critical conditions monitoring applications

Azzedine Boukerche, Richard Werner Nelem Pazzi, Regina Borges Araujo

October 2004 **Proceedings of the 7th ACM international symposium on Modeling, analysis and simulation of wireless and mobile systems**

Full text available:  pdf(864.88 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Sensor networks are increasingly being deployed for fine-grain monitoring of physical environments subjected to critical conditions such as fire, leaking of toxic gases and explosions. A great challenge to these networks is to provide a fast, reliable and fault tolerant channel for events diffusion, which meets the requirements of query-based, event-driven and periodic sensor networks application scenarios, even in the presence of emergency conditions that can lead to node failures and path disr ...

**Keywords:** publish/subscribe, routing protocol, sensor networks

**13** A signaling architecture for wireless ATM access networks

Nikos H. Loukas, Nikos I. Passas, Lazaros Merakos, Iakovos S. Venieris  
March 2000 **Wireless Networks**, Volume 6 Issue 2

Full text available:  pdf(350.88 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

A multiservice wireless Asynchronous Transfer Mode &lpar;ATM&rpar; access system is considered from a signaling protocol viewpoint. In an attempt to generalize and extend results and experiences obtained from the specification, design, and implementation of fixed ATM&dash;based access networks, we extend the concept of the broadband V interface &lpar;referred to as VB&rpar; for application to wireless ATM access networks. The proposed architecture follows the signaling structure of Broadban ...

**14** Multi-layer tracing of TCP over a reliable wireless link

Reiner Ludwig, Bela Rathonyi, Almudena Konrad, Kimberly Oden, Anthony Joseph  
May 1999 **ACM SIGMETRICS Performance Evaluation Review , Proceedings of the 1999 ACM SIGMETRICS international conference on Measurement and modeling of computer systems**, Volume 27 Issue 1

Full text available:  pdf(1.37 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** GSM, TCP, measurement tools, wireless

**15** CyPhone—bringing augmented reality to next generation mobile phones

Tino Pyssysalo, Tapio Repo, Tuukka Turunen, Teemu Lankila, Juha R ning  
April 2000 **Proceedings of DARE 2000 on Designing augmented reality environments**

Full text available:  pdf(6.46 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We describe a prototype implementation of a future mobile phone called CyPhone. In addition to voice calls, it has been designed to support context-specific and multi-user multimedia services in an augmented reality manner. Context-awareness has been implemented with GPS-based navigation techniques and a registration algorithm, capable of detecting a predefined 3-D model or a landmark in the environment. A new adaptive transport protocol has been developed to support real-time packet-switched ...

**Keywords:** mobile communication, navigation, networked virtual reality, real-time data transport protocols, registration

**16** Supporting mobility in publish/subscribe middleware: Client mobility in rendezvous-notify

Sasu Tarkoma, Jaakko Kangasharju, Kimmo Raatikainen  
June 2003 **Proceedings of the 2nd international workshop on Distributed event-based**

## systems

Full text available:  pdf(254.15 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Event-based computing is vital for the next generation mobile services and applications that need to meet user requirements irrespective of time and location. The event paradigm is a form of asynchronous one-to-many communication and allows clients to receive information that matches their interests through filtering. Event-based communication is a good candidate for mobile computing, because it is asynchronous and supports disconnected operation. However, user and terminal mobility present prob ...

**Keywords:** distributed events, mobile computing, session handover

### 17 Mobile networking in the Internet

Charles E. Perkins

December 1998 **Mobile Networks and Applications**, Volume 3 Issue 4

Full text available:  pdf(166.90 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Computers capable of attaching to the Internet from many places are likely to grow in popularity until they dominate the population of the Internet. Consequently, protocol research has shifted into high gear to develop appropriate network protocols for supporting mobility. This introductory article attempts to outline some of the many promising and interesting research directions. The papers in this special issue indicate the diversity of viewpoints within the research community, and it is ...

### 18 Characterization of queue fluctuations in probabilistic AQM mechanisms

Peerapol Tinnakornsrisuphap, Richard J. La

June 2004 **ACM SIGMETRICS Performance Evaluation Review , Proceedings of the joint international conference on Measurement and modeling of computer systems**, Volume 32 Issue 1

Full text available:  pdf(271.98 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We develop a framework for studying the interaction of a probabilistic active queue management (AQM) algorithm with a generic end-user congestion-control mechanism. We show that as the number of flows in the network increases, the queue dynamics can be accurately approximated by a simple deterministic process. In addition, we investigate the sources of queue fluctuations in this setup. We characterize two distinct sources of queue fluctuations; one is the deterministic oscillations which can be ...

**Keywords:** active queue management, central limit theorem, queue fluctuations

### 19 Improving TCP performance over mobile networks

Hala Elaarag

September 2002 **ACM Computing Surveys (CSUR)**, Volume 34 Issue 3

Full text available:  pdf(219.39 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

*Transmission Control Protocol* (TCP) is the most commonly used transport protocol on the Internet. All indications assure that mobile computers and their wireless communication links will be an integral part of the future internetworks. In this paper, we present how regular TCP is well tuned to react to packet loss in wired networks. We then define mobility and the problems associated with it. We discuss why regular TCP is not suitable for mobile hosts and their wireless links by p ...

**Keywords:** I-TCP, M-TCP, MTCP, New-Reno, Reno, SACK, TCP performance, WAP, WTCP,

base station, comparison of TCP implementations, end-to-end, link layer, mobile TCP, mobile host, mobile wireless networks, mobility, snoop, split TCP, standard TCP, wired networks, wireless TCP

## 20 Performance evaluation of ABR flow-control protocols in a wireless ATM network

Udo R. Krieger, Michael Savorić

January 2003 **Wireless Networks**, Volume 9 Issue 1

Full text available:  pdf (298.98 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Using an object-oriented simulation model of a basic client-server scenario in a wireless ATM network, we study the impact of handover and error-control protocols on the performance of high-speed data communication by the ABR service class. We present performance results of the ABR flow-control protocols ERICA and ERICA+ and discuss some implications for the protocol design.

**Keywords:** ABR flow-control, ERICA+, handover, wireless ATM

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